Amendments to the Claims

Listing of Claims - This will replace all prior listings of claims in the application:

1. (Currently Amended) An infeed system for feeding an array of workpieces linearly downstream to a processing machine ~~such as an optimizing planer~~ with at least one or more movable cutting elements or movable guiding elements, wherein the processing machine is an optimizing planer, a planer, a planer-matcher, or a moulder, the infeed system comprising:

a workpiece feed path, operatively coupled to ~~an optimizing planer~~the processing machine, the workpiece feed path including means for translating the array of workpieces downstream toward[[s a]] the processing machine; and

means, operatively coupled to the workpiece feed path, for setting the size of gaps between successive workpieces in the array of workpieces being translated linearly into the processing machine;

wherein the means for setting the size of gaps is configured to set the gaps to provide enough time for at least one of the movable cutting elements or the movable guiding elements to be moved ~~to their respective optimized~~a position[[s]] corresponding to the next successive workpiece in the array of workpieces.

2. (Currently Amended) The system~~apparatus~~ of claim 1 wherein the gap is sized to leave only enough time for at least one of the movable cutting elements or the movable guiding elements to be moved to the~~ir respective optimized~~ position corresponding to the next successive workpiece in the array of workpieces.

3. (Currently Amended) The system~~apparatus~~ of claim 1 wherein said means for setting the size of gaps includes

means for accelerating a workpiece of the array of workpieces along, and cooperating with, said workpiece feed path so as to control said size of gaps.

4. (Currently Amended) The systemapparatus of claim 3 further comprising workpiece transportation means for transporting the workpiece downstream from said means for accelerating workpiece speed to said processing machine, downstream to the planer.

5. (Currently Amended) The systemapparatus of claim 3 wherein the processing machine is an optimizing planer, the system further comprising:

an optimizing planer;

workpiece interrogation means for interrogating a the workpiece to determine workpiece data corresponding to attributes of the workpiece, and

a workpiece optimization system that receives the workpiece data corresponding to attributes of the workpiece from said workpiece interrogation means, determines an optimized cutting solution for the workpiece, and sends control instructions to said means for accelerating a the workpiece.

6. (Currently Amended) The systemapparatus of claim 3 wherein said means for accelerating a the workpiece includes one or more of a fixed speed transverse acceleration device, a variable speed transverse acceleration device, a vertical acceleration device, a fixed speed linear acceleration device, and a variable speed linear acceleration device.

7. (Currently Amended) The systemapparatus of claim 5 wherein said workpiece interrogation means includes one or more of a linear workpiece interrogator and a transverse workpiece interrogator.

8. (Currently Amended) The systemapparatus of claim 4 wherein said workpiece transportation means includes one or more of a fixed speed intermediate transport device and a variable speed intermediate transport device.

9. (Currently Amended) The systemapparatus of claim 3 wherein said workpiece feed path includes one or more of a sheet feeder, a fixed speed lug transfer and a variable speed lug transfer.

10. (Currently Amended) The systemapparatus of claim 1 further comprising a trimmer with trim decision information corresponding to one or more of the successive workpieces; wherein the setting of said size of gaps is determined in part by the trim decision information.

11. (Currently Amended) The systemapparatus of claim 1 further comprising a workpiece interrogator and means for determining in-piece gap-reduction for athe successive series of workpieces in the array of workpieces, wherein said means for setting the size of gaps between successive workpieces cooperates with is operatively coupled to the workpiece feed path and to said means for determining in-piece gap-reduction so as to reduce said size of gaps, the means for determining in-piece gap reduction being operatively coupled to the processing machine and configured to receive workpiece data corresponding to attributes of the successive workpieces from said workpiece interrogator, to determine an optimized planing solution for each of the successive workpieces, and to send control instructions to said means for setting the size of the gaps between successive workpieces,

where anwherein the optimized planing solution for a downstream first workpiece in of said successive series of workpieces provides for in-piece setting of the movable cutting elements within said downstream workpiece so as to pre-position the movable cutting elements for commencing an the optimized planing

solution for a ~~next adjacent upstream~~second workpiece ~~in said successive series of workpieces~~upstream of the first workpiece, whereby said size of gap between said ~~downstream~~ first and ~~upstream~~ second workpieces is ~~a~~ reduced ~~size of gap~~.

12. (Currently Amended) The system~~apparatus~~ of claim 11 wherein said size of gap is reduced to a substantially zero gap.

13. (Currently Amended) The system~~apparatus~~ of claim 5 wherein said workpiece optimization system is operatively coupled to said movable cutting elements and further comprises means for determining in-piece gap-reduction for a successive series of workpieces in the array of workpieces, wherein said means for setting the size of gaps between successive workpieces is operatively coupled to ~~cooperates with~~ said means for determining in-piece gap-reduction so as to reduce said size of gaps, where ~~an~~ the optimized planing solution for a first~~downstream~~ workpiece ~~in~~ of said successive series of workpieces provides for in-piece setting of the cutting elements within a second ~~said downstream~~ workpiece of said successive series of workpieces so as to pre-position the cutting elements for commencing ~~an~~ the optimized planing solution for a ~~next~~ second adjacent upstream workpiece ~~in~~ of said successive series of workpieces, whereby said size of gap between said downstream and upstream workpieces is ~~a~~ reduced ~~size of gap~~.

14. (Currently Amended) The system~~apparatus~~ of claim 13 wherein said ~~reduced~~ size of gap is reduced to substantially zero gap.

15. (Currently Amended) The system~~apparatus~~ of claim 1 wherein the processing machine is a planer, the system further comprising:

(a) workpiece sensing means for sensing one or more of the position, velocity and acceleration of a workpiece in the array of workpieces upstream of the planer; and

(b) a control system configured to~~that~~ receive[[s]] data from said workpiece sensing means and to use~~using~~ said data from said workpiece sensing means[[,]] to control[[s]] said size of gaps to do one or more of establish, control and correct a minimum required gap between each pair of successive workpieces of the array of workpieces.

16-20 (Cancelled)

21. (Currently Amended) The system~~apparatus~~ of claim 1, wherein said size of gap includes a safety factor.

22. (Currently Amended) The system~~apparatus~~ of claim 5 further comprising:

(a) workpiece sensing means for sensing one or more of the position, velocity and acceleration of a workpiece in the array of workpieces upstream of the planer; and

(b) a control system configured to ~~that~~ receive[[s]] data from the workpiece sensing means and to control[[s]] the size of gaps to do one or more of establish, control, and correct a minimum required gap between each pair of successive workpieces in the array of workpieces.

23. (Currently Amended) The system~~apparatus~~ of claim 22 wherein the control system and the workpiece optimization system are combined into a singular gap optimization system.

24. (Currently Amended) An infeed system configured to feed an array of workpieces linearly downstream to a processing machine with at least one or more movable cutting elements or movable guiding elements, wherein the processing machine is an optimizing planer, a planer, a planer-matcher, or a moulder, the infeed system comprising:

a workpiece feed path ~~adapted to~~ operatively coupled to the[[a]] processing machine ~~to feed an array of workpieces~~;

one or more workpiece acceleration devices, operatively coupled to the workpiece feed path, configured to~~for~~ adjust[[ing]] the speed of a workpiece in the array of workpieces;

one or more workpiece sensors operatively coupled to the workpiece feed path and configured to~~for~~ ~~determining~~ determine one or more of the position, velocity and acceleration of [[a]]the workpiece ~~in the array of workpieces~~;

a control system coupled to the one or more workpiece sensors and to the one or more workpiece acceleration devices, the control system configured to~~that~~ receive[[s]] the data from the one or more workpiece sensors and to adjust[[s]] the speed of the one or more workpiece acceleration devices in order to set the gap between successive workpieces in the array of workpieces.

25. (Currently Amended) The infeed system of claim 24, wherein the processing machine is an optimizing planer coupled to the control system and configured to determine optimized planing solutions for each of the successive workpieces, and wherein the gaps between the successive workpieces ~~in the array of workpieces is~~are set to allow enough time for the one or more ~~of~~ movable cutting elements or movable guiding elements in the ~~optimizing planer~~processing machine to be moved to ~~their respective optimized~~a position[[s]] corresponding to the optimized planing solution for the next successive workpiece ~~in the array of workpieces~~.

26. (Currently Amended) An infeed system comprising:

an infeed conveyor describing a path of workpiece flow, the infeed conveyor configured to transport a first and a second workpiece sequentially downstream along said path;

an acceleration device coupled to the infeed conveyor and configured to adjust the velocity of the first and the second workpieces along said path;

a variable speed drive coupled to the acceleration device and configured to control the acceleration device;

a workpiece sensor coupled to the infeed conveyor and configured to generate data corresponding to one or more attributes of the first and the second workpiece, said one or more attributes including at least one of position, velocity, and acceleration;

a cutting apparatus operatively coupled to the control system, the cutting apparatus having at least one movable guiding or cutting element, wherein the cutting apparatus is an optimizing planer, a planer, a planer-matcher, or a moulder; and

a control system coupled to the workpiece sensor and the variable speed drive, the control system configured to

receive said data from the workpiece sensor,

determine a length of time required to reposition the at least one movable guiding or cutting element between the first and second workpieces,

determine a desired gap between the first and second workpieces on said infeed conveyor based at least in part on said data and said length of time, and

send an instruction to the variable speed drive, the instruction comprising a command for adjusting operation of the acceleration device, wherein adjusting operation of the acceleration device adjusts the distance between the first and second workpieces to create the desired gap.

26. (Canceled)

27. (Currently Amended) The infeed system of claim 26, further comprising an optimizer coupled to the control system, the ~~further comprising an~~ optimizer configured to determine an optimized cutting solution for at least one of said first and said second workpiece.

28. (Currently Amended) The infeed system of claim 26, wherein said one or more attributes further includes at least one of work piece geometry and defect information~~at least one of workpiece speed, workpiece velocity, and workpiece position~~.

29. (Currently Amended) The infeed system of claim 26, ~~further comprising a cutting apparatus coupled to the infeed conveyor and the control system,~~ the cutting apparatus positioned downstream of said acceleration device.

30. (Currently Amended) The infeed system of claim ~~29~~27, the ~~control system~~optimizer further configured to determine ~~the desired gap between~~a trimming solution for at least one of the first and second workpieces ~~based at least in part on a minimum time required for repositioning a component of the cutting device~~.

31. (Currently Amended) The infeed system of claim 30, the control system further configured to determine the desired gap between the first and second workpieces based at least in part on one or more of said optimized cutting solution and said trimming solution.